COMMONWEALTH OF VIRGINIA
STATE AIR POLLUTION CONTROL BOARD
REGULATIONS FOR THE CONTROL AND ABATEMENT OF AIR POLLUTION

9 VAC 5 CHAPTER 40.
EXISTING STATIONARY SOURCES.

PART II.
Emission Standards.

ARTICLE 4.
Emission Standards for General Process Operations (Rule 4-4).

9 VAC 5-40-240. Applicability and designation of affected facility.

A. Except as provided in subsections C and D of this section, the affected facility to which the provisions of this article apply is each process operation, each process gas stream and each combustion installation.

B. The provisions of this article apply throughout the Commonwealth of Virginia.

C. Exempted from the provisions of this article are the following:

1. Process operations with a process weight rate capacity less than 100 pounds per hour.

2. Any combustion unit using solid fuel with a maximum heat input of less than 350,000 Btu per hour.

3. Any combustion unit using liquid fuel with a maximum heat input of less than 1,000,000 Btu per hour.

4. Any combustion unit using gaseous fuel with a maximum heat input of less than 10,000,000 Btu per hour.

D. The provisions of this article do not apply to a particular pollutant from an affected facility if the affected facility is subject to other emission standards in this chapter covering the same pollutant.

9 VAC 5-40-250. Definitions.

A. For the purpose of the Regulations for the Control and Abatement of Air Pollution and subsequent amendments or any orders issued by the board, the words or terms shall have the meaning given them in subsection C of this section.

B. As used in this article, all terms not defined here shall have the meaning given them in 9 VAC 5 Chapter 10 (9 VAC 5-10-10 et seq.), unless otherwise required by context.

C. Terms defined.

"Combustion installation" means all combustion units within a stationary source in operation prior to October 5, 1979.

"Combustion unit" means any type of stationary equipment in which solid, liquid or gaseous fuels and refuse are burned, including, but not limited to, furnaces, ovens, and kilns.

"Heat input" means the total gross calorific value of all fuels burned.

"Manufacturing operation" means any process operation or combination of physically connected dissimilar process operations which is operated to effect physical or chemical changes or both in an article.

"Materials handling equipment" means any equipment used as a part of a process operation or combination of process operations which does not effect a physical or chemical change in the material or in an article, such as, but not limited to, conveyors, elevators, feeders or weighers.

"Physically connected" means any combination of process operations connected by materials handling equipment and designed for simultaneous complementary operation.

"Process operation" means any method, form, action, operation or treatment of manufacturing or processing, including any storage or handling of materials or products before, during or after manufacturing or processing.

"Process unit" means any step in a manufacturing or process operation which results in the emission of pollutants to the atmosphere.

"Process weight" means total weight of all materials introduced into any process unit which may cause any emission of pollutants. Process weight includes solid fuels charged, but does not include liquid and gaseous fuels charged or combustion air for all fuels.

"Process weight rate" means a rate established as follows:

a. For continuous or long-run steady-state process operations, the total process weight for the entire period of continuous operation or for a typical portion of it, divided by the number of hours of such period or portion of it.

b. For cyclical or batch process operations, the total weight for a period that covers a complete operation or an integral number of cycles, divided by the hours of actual process operation during such a period.

"Reasonably available control technology" means the lowest emission limit that a particular source is capable of meeting by the application of control technology that is reasonably available, considering technological and economic feasibility.

"Rated capacity" means the capacity as stipulated in the purchase contract for the condition of 100% load, or such other capacities as mutually agreed to by the board and owner using good engineering judgment.

"Total capacity" means with reference to a combustion installation, the sum of the rated capacities (expressed as heat input) of all units of the installation which must be operated simultaneously under conditions of 100% use load.

9 VAC 5-40-260. Standard for particulate matter (AQCR 1-6).

A. No owner or other person shall cause or permit to be discharged into the atmosphere from any process unit any particulate emissions in excess of the limits in Table 4-4A.

TABLE 4-4A

Process Weight Rate		Maximum Allowable Emission Rate
Lb/Hr	Tons/Hr	Lb/Hr
100	0.05	0.551
200	0.10	0.877
400	0.20	1.40
600	0.30	1.83
800	0.40	2.22
1000	0.50	2.58
1500	0.75	3.38
2000	1.00	4.10
2500	1.25	4.76
3000	1.50	5.38
3500	1.75	5.96
4000	2.00	6.52
5000	2.50	7.58
6000	3.00	8.56
7000	3.50	9.49
8000	4.00	10.4
9000	4.50	11.2
10000	5.00	12.0
12000	6.00	13.6
16000	8.00	16.5
18000	9.00	17.9
20000	10.00	19.2
30000	15.00	25.2
40000	20.00	30.5
50000	25.00	35.4
60000	30.00	40.0
70000	35.00	41.3
80000	40.00	42.5
90000	45.00	43.6
100000	50.00	44.6
120000	60.00	46.3
140000	70.00	47.8
160000	80.00	49.1
200000	100.00	51.3
1000000	500.00	69.0
2000000	1000.00	77.6
6000000	3000.00	92.7

B. Except as provided in subsections C and D of this section, interpretation of the emission standard in subsection A of this section shall be in accordance with 9 VAC 5-40-22.

C. Interpolation of the data in Table 4-4A for process weight rates up to 60,000 lb/hr shall be accomplished by use of the following equation:

$$E = 4.10\ P^{0.67}$$

where:

E = emission rate in lb/hr.
P = process weight rate in tons/hr.

D. Interpolation and extrapolation of the data for process weight rates in excess of 60,000 lb/hr shall be accomplished by use of the following equation:

$$E = 55.0\ P^{0.11} - 40$$

where:

E = emission rate in lb/hr.
P = process weight rate in tons/hr.

9 VAC 5-40-270. Standard for particulate matter (AQCR 7).

A. No owner or other person shall cause or permit to be discharged into the atmosphere from any process unit any particulate emissions in excess of the limits in Table 4-4B.

TABLE 4-4B

Process Weight Rate		Maximum Allowable Emission Rate
Lb/Hr	Tons/Hr	Lb/Hr
100	0.050	0.46
150	0.075	0.66
200	0.100	0.85
250	0.125	1.03
300	0.150	1.20
350	0.175	1.35
400	0.200	1.50
450	0.225	1.63
500	0.250	1.77
550	0.275	1.85
600	0.300	2.01
650	0.325	2.12
700	0.350	2.24
750	0.375	2.34

800	0.400	2.43
850	0.425	2.53
900	0.450	2.62
950	0.475	2.72
1000	0.500	2.80
1100	0.55	2.97
1200	0.60	3.12
1300	0.65	3.26
1400	0.70	3.40
1500	0.75	3.54
1600	0.80	3.66
1700	0.85	3.79
1800	0.90	3.91
1900	0.95	4.03
2000	1.00	4.14
2100	1.05	4.24
2200	1.10	4.34
2300	1.15	4.44
2400	1.20	4.55
2500	1.25	4.64
2600	1.30	4.74
2700	1.35	4.84
2800	1.40	4.92
2900	1.45	5.02
3000	1.50	5.10
3100	1.55	5.18
3200	1.60	5.27
3300	1.65	5.36
3400	1.70	5.44
3500	1.75	5.52
3600	1.80	5.61
3700	1.85	5.69
3800	1.90	5.77
3900	1.95	5.85
4000	2.00	5.93
4100	2.05	6.01
4200	2.10	6.08
4300	2.15	6.15
4400	2.20	6.22
4500	2.25	6.30
4600	2.30	6.37
4700	2.35	6.45
4800	2.40	6.52
4900	2.45	6.60
5000	2.50	6.67
5500	2.75	7.03

6000	3.00	7.37
6500	3.25	7.71
7000	3.50	8.05
7500	3.75	8.39
8000	4.00	8.71
8500	4.25	9.03
9000	4.50	9.36
9500	4.75	9.67
10000	5.00	10.00
11000	5.50	10.63
12000	6.00	11.28
13000	6.50	11.89
14000	7.00	12.50
15000	7.50	13.13
16000	8.00	13.74
17000	8.50	14.36
18000	9.00	14.97
19000	9.50	15.58
20000	10.00	16.19
30000	15.00	22.22
40000	20.00	28.30
50000	25.00	34.30
60000 or more	30.00 or more	40.00

B. Interpretation of the emission standard in subsection A of this section shall be in accordance with 9 VAC 5-40-22.

9 VAC 5-40-280. Standard for sulfur dioxide.

A. Noncombustion process operations. No owner or other person shall cause or permit to be discharged into the atmosphere from any process operation any sulfur dioxide emissions in excess of an in-stack concentration of 2000 ppm by volume.

B. Combustion installations.

1. No owner or other person shall cause or permit to be discharged into the atmosphere from any combustion installation any sulfur dioxide emissions in excess of the following limits:

a. $S = 2.64K$ (AQCR 1 through 6)

b. $S = 1.06K$ (for liquid or gaseous fuels – AQCR 7)

c. $S = 1.52K$ (for solid fuels – AQCR 7)

where:

S = allowable emission of sulfur dioxide expressed in lbs/hr.
K = actual heat input at total capacity expressed in Btu x 10^6 per hour.

2. Where there is more than one unit in a combustion installation and where the installation can be shown, to the satisfaction of the board, to be in compliance when the installation is operating at total capacity, the installation will be deemed to still be in compliance when the installation is operated at reduced load or one or more units are shut down for maintenance or repair, provided that the same type of fuel with the same sulfur content, or an equivalent, is continued in use.

3. For installations in AQCR 7 at which different fossil fuels are burned simultaneously, whether in the same or different units, the allowable emissions shall be determined by proration using the following formula:

$$PS = K\left[\frac{X(1.06) + Y(1.52)}{X + Y}\right]$$

where:

PS = prorated allowable emissions of sulfur dioxide expressed in lb/hr.
X = percentage of actual heat input at total capacity derived from liquid or gaseous fuel.
Y = percentage of actual heat input at total capacity derived from solid fuels.
K = actual heat input at total capacity expressed in Btu x 10^6 per hour.

9 VAC 5-40-290. Standard for hydrogen sulfide.

No owner or other person shall cause or permit to be discharged into the atmosphere from any process gas stream any hydrogen sulfide emissions in excess of a concentration greater than 15 grains per 100 cubic feet of gas without burning or removing H_2S in excess of this concentration, provided that SO_2 emissions in the burning operation meet the requirements of 9 VAC 5-40-280 A.

9 VAC 5-40-300. Standard for volatile organic compounds.

A. No owner or other person shall cause or permit to be discharged from any affected facility any volatile organic compound emissions in excess of that resultant from using reasonably available control technology.

B. The provisions of this section apply to all facilities that (i) are within a stationary source in the Northern Virginia or Richmond Emissions Control Area (see 9 VAC 5-20-206) and (ii) are within a stationary source that has a theoretical potential to emit 25 tons per year or greater in the Northern Virginia Emissions Control Area or 100 tons per year or greater in the Richmond Emissions Control Area. Theoretical potential to emit shall be based on emissions at design capacity or maximum production and

maximum operating hours (8,760 hours/year) before add-on controls, unless the facility is subject to state and federally enforceable permit conditions which limit production rates or hours of operation. Emissions from all facilities, including facilities exempt from any other emission standard for volatile organic compounds in this chapter, shall be added together to determine theoretical potential to emit.

C. For facilities subject to the provisions of this section, the owners shall within three months of the effective date of this emission standard (i) notify the board of their applicability status, (ii) commit to making a determination as to what constitutes reasonably available control technology for the facilities and (iii) provide a schedule acceptable to the board for making this determination and for achieving compliance with the emission standard as expeditiously as possible but no later than the following dates:

1. For facilities in the Northern Virginia Emissions Control Area with a theoretical potential to emit 50 tons per year or greater, May 31, 1995.

2. For facilities in the Northern Virginia Emissions Control Area with a theoretical potential to emit 25 tons per year or greater, but less than 50 tons per year, May 31, 1996.

3. For facilities in the Richmond Emissions Control Area with a theoretical potential to emit 100 tons per year or greater, May 31, 1995.

9 VAC 5-40-310. Standard for nitrogen oxides.

A. No owner or other person shall cause or permit to be discharged from any affected facility any nitrogen oxides emissions in excess of that resultant from using reasonably available control technology.

B. Unless the owner demonstrates otherwise to the satisfaction of the board, compliance with the provisions of subsection A of this section shall be achieved for the applicable source types by the use of reasonably available control technology as defined in 9 VAC 5-40-311.

C. The provisions of this section apply to all facilities that (i) are within a stationary source in the Northern Virginia or Western Virginia Emissions Control Area (see 9 VAC 5-20-206) and (ii) are within a stationary source that has a theoretical potential to emit 25 tons per year or greater in the Northern Virginia Emissions Control Area, or 100 tons per year or greater in the Western Virginia Emissions Control Area. Theoretical potential to emit shall be based on emissions at design capacity or maximum production and maximum operating hours (8,760 hours/year) before add-on controls, unless the facility is subject to state and federally enforceable permit conditions which limit production rates or hours of operation. Emissions from all facilities, including facilities exempt from any other emission standard for nitrogen oxides in this chapter, shall be added together to determine theoretical potential to emit.

D. For facilities subject to the provisions of subsection A of this section, the owners shall within three months of the effective date of the emission standard (i) notify the board of their applicability status, (ii) commit to making a determination as to what constitutes reasonably available control technology for the facilities and (iii) provide a schedule acceptable to the board for making this determination and for achieving compliance with the emission standard as expeditiously as possible but no later than the following dates:

1. For facilities in the Northern Virginia Emissions Control Area with a theoretical potential to emit 50 tons per year or greater, May 31, 1995.

2. For facilities in the Northern Virginia Emissions Control Area with a theoretical potential to emit 25 tons per year or greater, but less than 50 tons per year, November 15, 2005.

3. For facilities in the Western Virginia Emissions Control Area with a theoretical potential to emit 100 tons per year or greater, November 15, 2005.

E. For facilities to which the provisions of subsection B of this section are applicable, the owners shall within three months of the effective date of the emission standard (i) notify the board of their applicability status, (ii) commit to accepting the emission standard as reasonably available control technology for the applicable facilities or to submitting a demonstration as provided in subsection B of this section and (iii) provide a schedule acceptable to the board for submitting the demonstration no later than the dates specified in subdivisions 1, 2, and 3 of this subsection, and for achieving compliance with the emission standard as expeditiously as possible but no later than the dates specified in subdivisions 4, 5, and 6 of this subsection.

1. For facilities in the Northern Virginia Emissions Control Area with a theoretical potential to emit 50 tons per year or greater, January 1, 1994.

2. For facilities in the Northern Virginia Emissions Control Area with a theoretical potential to emit 25 tons per year or greater, but less than 50 tons per year, January 1, 2004.

3. For facilities in the Western Virginia Emissions Control Area with a theoretical potential to emit 100 tons per year or greater, January 1, 2004.

4. For facilities in the Northern Virginia Emissions Control Area with a theoretical potential to emit 50 tons per year or greater, May 31, 1995.

5. For facilities in the Northern Virginia Emissions Control Area with a theoretical potential to emit 25 tons per year or greater, but less than 50 tons per year, November 15, 2005.

6. For facilities in the Western Virginia Emissions Control Area with a

theoretical potential to emit 100 tons per year or greater, November 15, 2005.

F. No owner or other person shall cause or permit to be discharged from any facility any nitrogen oxides emissions in excess of those necessary to achieve emissions reductions identified in any attainment or maintenance plan or any other legally enforceable document submitted to the U.S. Environmental Protection Agency as a revision to the state implementation plan.

1. The facilities to which the provisions of this subsection apply are facilities within the Richmond Emissions Control Area (see 9 VAC 5-20-206) identified in any attainment or maintenance plan submitted to the U.S. Environmental Protection Agency as a revision to the state implementation plan.

2. The board may establish case-by-case emission limits and other requirements as may be necessary to achieve the required emission reductions via permits, consent orders, or other legally enforceable means.

3. Facilities subject to this subsection shall be in compliance with any limits and other requirements established pursuant to subsection F 2 of this section within the timeframes established in any state plan revision, permit, or other legally enforceable document.

4. The provisions of subsections A through E of this section shall not apply to facilities within the Richmond Emissions Control Area (see 9 VAC 5-20-206).

9 VAC 5-40-311. Reasonably available control technology guidelines for stationary sources of nitrogen oxides.

A. General.

Unless otherwise approved by the board, this section defines reasonably available control technology for the purposes of compliance with 9 VAC 5-40-310 A for the source types specified here.

B. Definitions.

1. For the purpose of this section and subsequent amendments or any orders issued by the board, the words or terms shall have the meaning given them in subdivision B 3 of this section.

2. As used in this section, all terms not defined here shall have the meaning given them in 9 VAC 5 Chapter 10 (9 VAC 5-10-10 et seq.), unless otherwise required by context.

3. Terms defined.

"Capacity factor" means the ratio of the average load on a machine or equipment for the period of time considered to be the capacity rating of the machine or equipment.

"Combustion modification" means any change to the configuration of the burners or the firing method or mechanism of any combustion equipment for the purpose of reducing the emissions of nitrogen oxides. Acceptable combustion equipment changes within the context of this term include, but are not limited to, reburning, burners out of service, flue gas recirculation, fuel substitution, engine adjustments, engine modifications, fuel modifications and the addition of over fire air and low nitrogen oxides burner systems.

"Fossil fuel" means natural gas, petroleum, coal and any form of solid, liquid or gaseous fuel derived from such materials for the purpose of creating useful heat.

"Fuel burning equipment" means any furnace, with fuel burning equipment appurtenances thereto, used in the process of burning fuel for the primary purpose of producing heat to be utilized by indirect heat transfer or producing power. This includes facilities that are designed as boilers to produce steam or heated water and are designed to burn either fossil fuel or refuse derived fuel. It does not include such facilities if designed primarily to burn raw refuse.

"Gas turbine" means a rotary internal combustion engine fueled by liquid or gaseous fuel.

"Heat input" means the total gross calorific value of all fuels burned.

"Incinerator" means any device, apparatus, equipment, or structure using combustion or pyrolysis for destroying, or reducing the volume of any material or substance.

"Internal combustion engine" means a reciprocating engine which is fueled by liquid or gaseous fuel.

"Process heater" means any fuel burning equipment which is used to produce heat for use in a manufacturing process. This term includes boilers which use a heat transfer medium other than water, but does not include drying ovens, steam generating units, or other drying apparatus.

"Rated capacity" means the capacity as stipulated in the purchase contract for the condition of 100% load, or such other capacities as mutually agreed to by the board and owner using good engineering judgment.

"Refuse derived fuel (RDF)" means fuel produced from solid or liquid waste (includes materials customarily referred to as refuse and other discarded materials)

or both which has been segregated and classified, with the useable portions being put through a size reduction and classification process which results in a relatively homogeneous mixture.

"Steam generating unit" means any furnace, boiler or other device used for combusting fuel for the purpose of producing steam.

C. Definition of reasonably available control technology.

1. For the source types listed below, reasonably available control technology is defined as the emission limits specified below based upon the application of combustion modification; however, owners may elect to use any alternative control technology, provided such alternative is capable of achieving the prescribed emission limits.

a. Steam generating units and process heaters. The maximum allowable emission rate for nitrogen oxides from steam generating units and process heaters is as follows:

TABLE 4-4C

Maximum Allowable Emission Rates for Nitrogen Oxides Emissions from Steam Generating Units and Process Heaters (pounds per million Btu heat input)

Fuel Type	Firing Method		
	Face* and Tangential	Cyclone	Stokers
Coal – wet bottom	1.0	.55	N/A
Coal – dry bottom	.38	N/A	0.4
Oil or Gas or both	.25	.43	N/A
Gas only	.20	N/A	N/A

* Includes wall, opposed and vertical firing methods

b. Gas turbines. The maximum allowable emission rate for nitrogen oxides from gas turbines is as follows:

TABLE 4-4D

Maximum Allowable Emission Rates for Nitrogen Oxides Emissions from Gas Turbines (parts per million by dry volume corrected to 15% oxygen)

Fuel Type	Turbine Type	
	Simple Cycle	Combined Cycle
Gas	42	42
Oil	65/77*	65/77*

* Limit shall be 65 ppm for fuel bound nitrogen (FBN) < 0.015% and 77 ppm for FBN $\geq$ .015%.

2. Any demonstration of compliance with the limits in subdivision C 1 of this section shall be on a daily basis.

3. For the source types and sizes listed below, a demonstration of reasonably available control technology is not required as provided in 9 VAC 5-40-310 B.

a. Any steam generating unit, process heater or gas turbine with an annual capacity factor of less than 5.0%, except that three months following any calendar year during which the capacity factor is 5.0% or greater, the facility shall be subject to 9 VAC 5-40-310 A or B, as applicable, and the owner shall comply with 9 VAC 5-40-310 D or E, as applicable, except the compliance date shall be two years after approval of the schedule by the board. Time periods during which a stand-by unit is used to provide replacement services for a unit being altered to comply with the provisions of 9 VAC 5-40-310 A or B shall not be used as the basis for a determination that the stand-by unit exceeded the annual capacity factor criteria of 5.0%.

b. Any stationary internal combustion engine with a rated capacity of less than 450 hp of output power.

c. Any incinerator with a maximum capacity of less than 50 tons of waste per day.

d. Any incinerator or thermal or catalytic oxidizer used exclusively as air pollution control equipment.

e. Any generator used solely to supply emergency power to buildings during periods when normal power supplies are interrupted and during periods of scheduled maintenance.

9 VAC 5-40-320. Standard for visible emissions.

The provisions of Article 1 (9 VAC 5-40-60 et seq.) of this chapter (Emission Standards for Visible Emissions and Fugitive Dust/Emissions, Rule 4-1) apply.

9 VAC 5-40-330. Standard for fugitive dust/emissions.

The provisions of Article 1 (9 VAC 5-40-60 et seq.) of this chapter (Emission Standards for Visible Emissions and Fugitive Dust/Emissions, Rule 4-1) apply.

9 VAC 5-40-340. Standard for odor.

The provisions of Article 2 (9 VAC 5-40-130 et seq.) of this chapter (Emission Standards for Odor, Rule 4-2) apply.

9 VAC 5-40-350. Standard for toxic pollutants.

The provisions of Article 3 (9 VAC 5-40-160 et seq.) of this chapter (Emission Standards for Toxic Pollutants, Rule 4-3) apply.

9 VAC 5-40-360. Compliance.

The provisions of 9 VAC 5-40-20 (Compliance) apply.

9 VAC 5-40-370. Test methods and procedures.

The provisions of 9 VAC 5-40-30 (Emission Testing) apply.

9 VAC 5-40-380. Monitoring.

The provisions of 9 VAC 5-40-40 (Monitoring) apply.

9 VAC 5-40-390. Notification, records and reporting.

The provisions of 9 VAC 5-40-50 (Notification, Records and Reporting) apply.

9 VAC 5-40-400. Registration.

The provisions of 9 VAC 5-20-160 (Registration) apply.

9 VAC 5-40-410. Facility and control equipment maintenance or malfunction.

The provisions of 9 VAC 5-20-180 (Facility and Control Equipment Maintenance or Malfunction) apply.

9 VAC 5-40-420. Permits.

A permit may be required prior to beginning any of the activities specified below and the provisions of 9 VAC 5 Chapter 50 (9 VAC 5-50-10 et seq.) and 9 VAC 5 Chapter 80 (9 VAC 5-80-10 et seq.) may apply. Owners contemplating such action should contact the appropriate regional office for guidance.

A. Construction of a facility.

B. Reconstruction (replacement of more than half) of a facility.

C. Modification (any physical change to equipment) of a facility.

D. Relocation of a facility.

E. Reactivation (restart-up) of a facility.

F. Operation of a facility.

HISTORICAL NOTES:

Derived from: Rule 4-4 of Part IV of VR 120-01 (§ 120-04-0401 through § 120-04-0419)

Effective Date: March 17, 1972
Promulgated: March 17, 1972
Amended: August 6, 1978
Amended: October 6, 1978
Amended: August 3, 1979
Amended: January 1, 1985
Amended: July 1, 1991
Amended: January 1, 1993
Amended: April 1, 1996
Amended: July 1, 1997
Amended: January 1, 2002
Amended: June 4, 2003
Amended: March 24, 2004

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